

ABSTRACT

The present invention provides novel DNA sequences coding for protoporphyrinogen oxidase (protox) enzymes from soybean, wheat, cotton, sugar beet, oilseed rape, rice, sorghum, and sugar cane. In addition, the present invention teaches modified forms of protox enzymes that are herbicide tolerant. Plants expressing herbicide tolerant protox enzymes taught herein are also provided. These plants may be engineered for resistance to protox inhibitors via mutation of the native protox gene to a resistant form or they may be transformed with a gene encoding an herbicide tolerant form of a plant protox enzyme. The present invention further provides shuffled DNA molecules encoding protox enzymes having enhanced tolerance to a herbicide that inhibits the protox activity encoded by a template DNA molecule from which the shuffled DNA molecule is derived.